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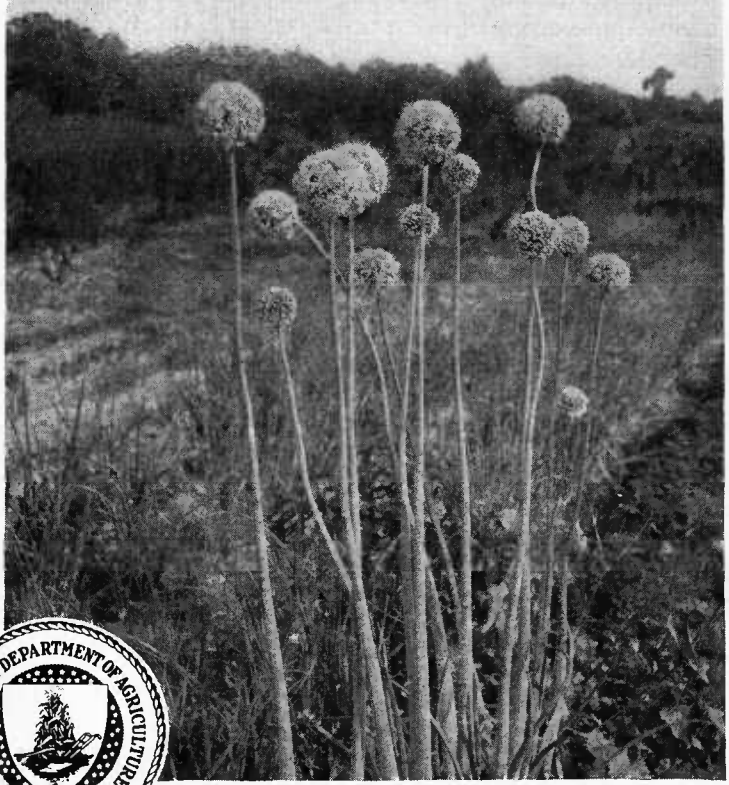
VEGETABLE SEEDS FOR THE HOME AND MARKET GARDEN



THE HOME GARDEN and the market garden have originated most of our present American vegetable varieties.

The tendency of our horticulture at present is toward the large-scale production of vegetables, often for shipping long distances, and this has caused a decided lessening of the number of varieties handled. The characters necessarily chosen for those retained are determined by shipping and market requirements, and too often high culinary quality has been neglected.

Both the home and market gardener are in a position to profit by growing vegetables of high culinary quality.

It is important that the production of improved strains by gardeners should be encouraged, and with that purpose in view this bulletin aims to give plain and explicit directions for saving the seed of garden vegetables on a small scale.

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VEGETABLE SEEDS FOR THE HOME AND MARKET GARDEN.[1]

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CONTENTS.

SHOULD GARDENERS GROW THEIR SEED?

IN MANY CASES it will not pay gardeners to grow their seed. The trucker who produces a few things in large quantity for shipment can rarely produce his seed economically. His methods are not intensive and his seed requirements are large.

The home or local market gardener can often meet his own seed requirements, at least for some of his vegetables. He can get full value for vegetables of higher quality, as he is in direct connection with the consumer. The more intensively he works his soil the more important the quality and uniformity of his seed will be to him. The most intensive cultivation is given to greenhouse crops, and the greenhouse gardener therefore can often save his own seed to very great advantage.

ADVANTAGES OF HOME SEED GROWING.

In earlier times the home saving of seeds was the rule. Many garden varieties carry place names, which usually indicate that they have been developed by community selection in the localities shown. As late as the middle of the last century many individual market gardeners in this country jealously guarded the seed of certain varieties and strains which represented years of intelligent selection in their hands. A few such superlative varieties are yet to be found in the possession of gardeners near the old market-gardening centers. In the past also the village and farm gardener saved his own seed of the few varieties of vegetables he grew. This custom has practically ceased, but here and there are farmers and villagers who cling to "family" varieties of certain vegetables. Local types of long standing are probably most common in the Appalachian

[1] This bulletin supersedes Farmers' Bulletin 884, which was prepared by the late Dr. W. W. Tracy, sr., as a war-emergency publication. Based on and retaining most of the one it supersedes, this bulletin has been somewhat extended by the junior author and revised to meet present conditions.

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Mountain region. European gardeners have retained local or family varieties much more tenaciously than Americans.

That there are advantages in thus saving seed where it is grown is generally recognized. This widespread opinion is also held by seedsmen, since the enthusiastic description of a novelty frequently includes a history of its having been secured with great difficulty from skillful growers in whose possession it had remained for many years or even for generations. These advantages are twofold: (1) The selection which the gardener gives his seed plants, while not greater than the seed grower gives his seed stock, is often better than can be given to the seed that is placed on the market; and (2) the plants selected will be the ones which succeed best under the local environment.

The following instructions are directed to methods of seed saving rather than of seed selection, as few persons have the insight, patience, perseverance, and enthusiasm required for the development of valuable new varieties of vegetables.

Certain vegetables in which cross-pollination is normal will of course mix badly if two varieties are seeded in one garden together. Weather or other conditions sometimes cause a short crop of seed or a failure. Fortunately, well-matured seeds, if properly stored, with the possible exception of those of the parsnip and onion, will retain their viability for 3 to 5 years. It is thus possible to tide over poor years and to grow all the seed needed for a smaller garden, even to the extent of handling two or more varieties of one vegetable.

MARKETING HOME-SAVED SEED.

A grower may wish to sell some of his surplus seed. His best opportunity to do this will be among his neighbors who are acquainted with him and his variety or strain. It is difficult to dispose of small lots to seedsmen, who must make these acquaintances before risking a purchase. It will sometimes be possible to make a deal with a seedsman after the selection or strain has proved itself of value and so has established a reputation.

Since in the vegetable-seed trade seeds are usually grown on contract, a gardener wishing to try commercial seed growing will find it best to apply to wholesale seed-growing firms, giving an account of his experience and his facilities for seed growing. A seedsman rarely makes a contract until he has had a representative examine the project. They have found that a contract protects both parties as well as the seed stocks, so this is nearly always required.

VEGETABLES CLASSIFIED FOR SEED-GROWING PURPOSES.

Vegetables may be grouped in many different ways, but probably the most useful classification for the purposes of this bulletin is that based on seeding habit, whether annual, biennial, or perennial. (Table 1.) A secondary basis is found in the part of the plant which is used for food, whether seed, fruit, leaf and stem, or root. The use of these bases for classification makes 12 possible groups, in seven of which are found subjects to be placed. It is interesting to note that all seed and fruit vegetables are annuals and that most leaf, stem, and root vegetables are biennials.

TABLE 1.—*Vegetables grouped according to parts used for food.*

Duration.	Parts used for food.			
	Seed.	Fruit.	Stem and (or) leaf.	Root.
Annuals, producing seed the year they are sown.	Beans. Corn. Peas.	Beans (snap). Cucumber. Eggplant. Muskmelon. Okra. Peas (sugar). Pepper. Squash. Tomato. Watermelon.	Cress. Endive. Lettuce. Mustard.	Radish (early).
Biennials, producing seed after a winter rest.	.....	.....	Brussels sprouts. Cabbage. Cauliflower. Celery. Collard. Endive. Kale. Kohl-rabi. Leek. Onion. Parsley. Potato. Spinach.	Beet. Carrot. Celeriac. Parsley. Parsnip. Radish (late). Salsify. Turnip.
Perennials.	.....	.....	Asparagus. Rhubarb.	

PLANTS WHICH BEAR SEED THE YEAR THEY ARE PLANTED (ANNUALS).

Many garden plants are annuals, including all those of which the seed or the fruit is the part eaten. Only a few of those vegetables of which some part of the growing plant is used for food are annuals.

VEGETABLES THE SEEDS OF WHICH ARE EATEN.

Very little care is required to save seed for a home supply of the crops of which the seeds are eaten, since the seed is well advanced toward maturity when usable. Selection is important in this group, however, especially to insure healthy seed. Any surplus dried seed of these plants may be used for food.

BEANS AND PEAS.

The best seed of beans and peas can be obtained by marking a few of the finest plants with a bit of cloth at the beginning of the harvesting season and allowing the entire crop of these plants to ripen for seed. In making such selections it is best to choose plants most alike in varietal character and earliness. When ripened until the pods are dry, pull these plants in the early morning, in order to avoid shattering, and hang or spread them in any airy, dry place until the seed is quite hard. Then shell the seed, spread it out not over two or three grains deep, and when dry store it for the winter in bags of coarse open-meshed fabric hung in a cool, dry place.

Pods which for any reason have been overlooked when picking beans or peas for the table should be saved, since they can be shelled for seed, though inferior to the selected stock described above. In saving seed from remnant crops of this kind it is well to discard all pods containing only one or two seeds, as these may have come from plants with a tendency to produce poorly filled pods.

Some very destructive bean diseases, including pod-spot, are carried in the seed; so it is extremely important to observe the general rule that no seed should be saved from diseased plants. Never save seed from pods which are not bright and clean.

SWEET CORN.

The best seed corn can be obtained by allowing it to ripen on the plant, and since a single ear will plant a small garden it is quite practicable to do this. Select the best and earliest ears by stripping down the husks to examine the grain and to remove any worms that may be found, and then carefully fold them back and hold them in place by an elastic band or a string. Allow these ears to ripen thoroughly on the stalk. In the North it is often better to pull and hang the plant where there will be no danger from moisture, frost, or even chilling until the seed is thoroughly dry. All the ripe ears remaining at the end of the season in any crop of sweet corn should be harvested and saved. The best ears will make passably good seed, and everyone whose early life was spent on a farm remembers the enjoyment that was to be found in parched sweet corn.

Sweet corn spoils much more quickly than field corn and can not readily be cured in large shocks, but should be husked from the stalk and spread thinly on staging to cure. A convenient way of storing sweet corn is on the ear.

VEGETABLES THE FRUITS OF WHICH ARE EATEN.

A fruit which is developed from a blossom consists of the seed and its inclosing parts. It is not necessarily fleshy, though that is the popular conception of the term. It is a simple matter to save seeds of these vegetable fruits. They are in large part allowed to ripen before being brought to the table, and there is only the additional trouble of cleaning the seeds, which otherwise would be discarded.

CUCUMBER AND SUMMER SQUASH.

Cucumbers and summer squashes are used commonly long before they are ripe, or even before they have reached their full size, the one for pickles or for salad, the other as a vegetable. In saving seeds, select and mark fruits of desirable character while in the usable stage and allow them to remain on the vines until fully ripe, which will be indicated by a change of color, or by this change and a hardening of the surface. Split the ripe fruits, scrape out the seed and pulp, and wash them until clean, pouring off the refuse and light, floating seeds. Seedsmen when handling large quantities ferment the mass of seed and pulp from these and other fleshy fruits, but most home gardeners will find it simpler to clean the seed immediately in one operation. Then, spread the washed seed not over two grains deep and place it in the bright sunshine to dry. Stir the seed frequently while drying, but do not subject it to frost or even a severe chill. Any quantity less than a quart of seed should be ready for storing after one day's drying. If a large quantity of seed is being saved, it is important not to bulk it until thoroughly dry, as it heats readily. This will take from two to five days.

WINTER SQUASH, MUSKMELON, AND WATERMELON.

The fruits in this group are not used until ripe. Seed saving consists of selecting satisfactory fruits of high quality and in washing the seed with water until clean; then spreading, stirring occasionally until dry, and storing.

TOMATO.

The character of plant is of great importance. Select one or more plants which bear a high proportion of good fruits, taking into account size, smoothness, solidity, and freedom from cracking in the fruit, and vigor, productiveness, and freedom from disease in the plant.

The entire seed crop of a plant producing uniformly good fruit will be better than that from a superlative fruit from a plant with uneven and some inferior fruits. Tag the fruits on these selected plants and allow them to ripen on the plant until past their edible condition, but do not permit them to decay. Halve the fruits by cutting across the cells. By gentle pressure it is then possible to squeeze the seeds and seed pulp free from the flesh and skin of the tomato. Fold the seeds with the softer pulp into a square of coarse muslin, and work this energetically with the fingers under water. It is thus possible to clean the seeds very nicely by forcing the pulp out through the cloth. When clean, spread the seed thinly in an airy place until dry and then store it.

If half a pound or more of seed is to be saved it will pay to allow the crushed fruit to ferment for two days in a cask or bucket, with frequent stirring of the mass. The seeds will settle to the bottom, and the pulp will rise to the surface, from which it can be poured. The seed should be washed with pure water until clean, spread out thinly, stirred frequently until dry, and then bagged.

EGGPLANT.

For the home garden, seeds of the eggplant in sufficient number can be picked from ripe fruit with a penknife and dried and stored.

To save larger quantities of seed, allow the fruits to become thoroughly ripe. Cut off the stems and reduce to a pulp by grinding or in a mortar. Wash immediately, using two screens of different mesh. Spread very thinly and dry quickly. If seed is not sufficiently dry by night it often sprouts and is lost.

PEPPER.

Select well-ripened fruits of peppers, spread the seed thinly until very dry, and then store it.

OKRA.

Okra seed for a small garden can best be secured by selecting one or more plants for seed, picking the early pods until the plant is growing vigorously, and then allowing it to set and mature a full crop of pods. The varieties having angular pods will split open and the seed will be lost unless the ripe pods are harvested immediately. The round or velvet podded varieties may be left on the plant until all are ripe, since they do not split open. The seeds after removal from the pods are to be dried and stored.

ANNUALS THE STEMS OR LEAVES OF WHICH ARE EATEN.

Only four stem-and-leaf vegetables can be grown for seed the first year with any certainty of success.

LETTUCE.

Lettuce is an annual crop, and if the seed is planted early enough so that the setting and ripening do not occur during the greatest heat of summer all varieties may be seeded. The safest practice is to start the plants intended for seed in hotbeds or coldframes and then transplant to the garden. As the plants reach edible maturity select a few of the most satisfactory ones for seed, cut out any crowd-

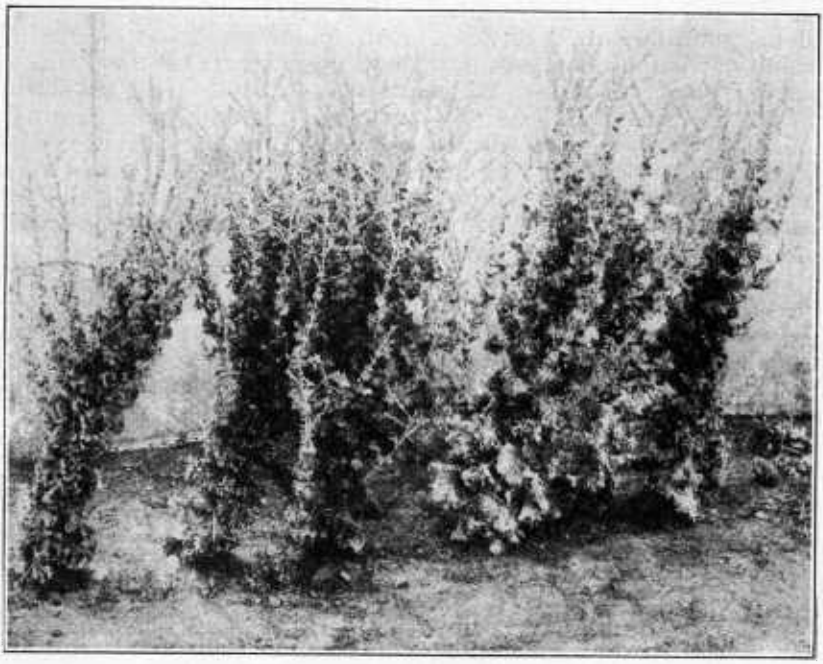

FIG. 1.—Seeding plants of lettuce. These will soon be ready for harvest.

ing plants, give the soil a shallow cultivation, and if the season is very dry water the plants. As the seeding plants develop it may be necessary with some of the harder heading sorts to cut or pull the head leaves carefully apart to allow the seed stalk to push through.

The seed crop matures slowly. When the first seed heads open so that there is danger of serious loss from shattering, pull the plants (fig. 1) and put them, roots up, in a paper bag, hanging it in a dry, airy place until the seed is fully ripened. Then thresh it, clean it of stems and dirt by sifting and winnowing, and store in a dry place.

MUSTARD.

Mustard seed can readily be grown from a crop sown in very early spring. When the pods have turned yellowish, cut the seed stalks in the early morning and spread them on paper or cloth under

shelter. When the pods are quite dry, beat out the seed and spread it thinly for a week or 10 days, as it heats readily if in large bulk.

ENDIVE.

If planted very early this may be grown as an annual, but it is better treated as a biennial. (See page 8.)

GARDEN CRESS.

This plant grows very readily and seeds quickly. Plants showing the most desirable leaf should be chosen and allowed to grow to seed. They should be pulled before the seed pods open, and after being dried the seed should be beaten out and stored.

ANNUALS THE ROOTS OF WHICH ARE EATEN.

Early radishes are the only root vegetable falling within this group. Most varieties of early radish planted in the spring as soon as the ground can be worked will produce seed. In such crops some plants will shoot to seed quickly, but they are usually the poorest stock, and the seed of these can not be depended upon to give good roots. It is better, therefore, to pull the plants and to select carefully some of the finest roots for seeding. Cut off most of the top, leaving a few small central leaves. Lay the plants in a moist, airy place for a few hours, or over night, to harden; then carefully set them out with the crown about an inch below the surface. Usually most of them will start into growth and mature a crop of seed. When this ripens, cut the plants and lay them on a sheet exposed to the sun. The seed will harden quickly and can then be beaten out, thoroughly dried, and stored.

PLANTS WHICH REQUIRE A WINTER REST BEFORE PRODUCING SEED (BIENNIALS).

The biennials include nearly all the vegetables of which we use the growing parts, such as stems, leaves, or roots. One must plan beforehand in growing seed of these, since they must be carried over winter and usually require protection.

BIENNIALS THE STEMS OR LEAVES OF WHICH ARE EATEN.

SPINACH.

Spinach may occasionally be grown for seed as an annual, but to be successful it must be planted very early. The crop which has been wintered over is much better for seed growing. With the protection of a light covering of straw it may be planted in the autumn and wintered over in all parts of the United States. This protection is not necessary south of the latitude of Philadelphia.

As spinach plants come into flower and fruit they may be seen to differ materially; one, which is usually the first to bloom, will produce on tall stems an abundance of pollen, which is easily blown about by the wind, but no seed; the other will produce no pollen, but at each leaf on the upper part of the stem will appear round or more or less prickly fruits, which if the plant stands near one of the first kind will develop seed. Both sorts of plants grown near

each other are essential to the production of seed. The seed matures slowly and unevenly. Plants should be pulled and put in a paper bag, which should be hung in a protected place until the seed is ripe and dry, when it can be threshed off, winnowed, and stored.

ENDIVE.

To grow seed of the endive it is best to plant the crop in the late fall (September in the latitude of Philadelphia), winter over the plants in coldframes, and grow to seeding in the spring. The plants bloom through a long season and should be pulled and hung up to dry when most of the heads are ripe. They are difficult to thresh, but after drying can be placed in a stout bag and beaten until seeds are released. These must then be sifted, winnowed, and stored.

Seed-eating birds, especially goldfinches, are very fond of endive seed. Where only a few plants are being grown for seed it is almost necessary to cover them with netting to prevent the birds from eating the seed as rapidly as it ripens.

KALE, COLLARDS, CABBAGE, CAULIFLOWER, AND KOHL-RABI.

All the plants in this group require the same care in harvesting and curing the seeds. As they shatter from the seed pods very readily, it is best to cut the seed stalks when the pods have turned yellow. Early morning, when the plants are moist with dew, is the best time to harvest. Spread the plants in a dry, airy place on sheets of paper or cloth to ripen and cure. When the seed is quite hard, beat it out, and spread it in a thin layer for further curing. All these precautions are necessary, because these seeds heat very quickly if not entirely ripe and dry. They will hybridize freely among themselves, so that one should not attempt to grow more than one crop of this group in the same garden at the same time.

Kale and collards are very hardy and may be left out all winter, with slight protection in the North. They will send up blossom stems early in the spring and mature a crop of seed.

Kohl-rabi should be planted in midsummer, so as to make good-sized "bulbs" for storing in trenches or coldframes. They are set for seed in early spring.

Seed of cabbage in large quantities is grown in many different ways. In some places the stumps from which matured heads have been cut are successfully set for seeding. In Denmark the head and a bit of the stem are cut off and wintered in shallow trenches. In early spring they throw out roots like a giant cutting, start into growth, and produce a good crop of seed. On Long Island plants are set so late in the season that they do not develop marketable heads before the ground closes up in the fall, but the plants are stored in trenches, given a little protection, and when set in the spring will produce a crop of seed. It is possible to grow seed from any part of the cabbage plant that includes a bit of the stem that has wintered so as to be in green and healthy condition. It is generally necessary, however, in order to secure a good yield, to set out two or more plants (fig. 2), as a single plant rarely produces seed. Plants for seeding should be set as early in spring as practicable and protected from frost, especially if they have been blanched in storing.

Growing cauliflower seed is such an uncertain venture for out of doors that it is not worth while for the gardener without a greenhouse to undertake it. The plants must be stored in trenches or cold cellars over winter and planted outside as soon in the spring as weather will permit. The difficulty in storing is great, and skill is needed to make a successful business of growing cauliflower seed. It is easy to grow a home supply of seed if one has a greenhouse. The plants for the seed crop should be started from October 1 to 15 and given abundant space in the greenhouse. It is important that none of the outer leaves be allowed to decay, or the whole plant may be lost.

PARSLEY.

Parsley is hardy and south of Philadelphia may safely be left in place in the garden for seeding in the spring. In the North it will require only a slight earth covering to withstand the winter. The seed is produced in flat-topped clusters. When there is danger of loss of the seed, cut the plants, dry on a sheet, thresh, and store.

FIG. 2.—Seeding plants of cabbage. Note that two plants are set together for cross-pollination and that the seed stems are staked.

CELERY.

Celery is not grown extensively enough in home gardens to make home seed saving an important consideration. Plants which have been stored for winter, if carried over and planted early in the spring, will flower and ripen seed in early summer. The seed is borne in flat-topped clusters and does not ripen all at once. When the larger clusters are ripe the plant should be pulled and hung in a dry, shady place with good ventilation. As soon as the seed is well ripened, beat it off, clean, and store it.

ONION.

The edible part of the onion is composed of the swollen bases of the leaves, which accounts for onions being placed here rather than with root crops. Seed is not produced until the second season, after the bulbs have had a period of rest, but it is essential to the production of good seed that the seed-bearing bulbs should be well rooted. Often bulbs which have failed to make vigorous root growth will develop blossom heads and seem to set seed, which, however, will be found to have very little vitality. One will be most likely to succeed by selecting well-matured bulbs late in the autumn, setting them so that the crowns are about 3 inches below the surface, and

then gradually at the approach of cold weather ridging the earth over them to prevent their freezing. Early in spring, remove the ridges gradually; and as the seed stalks develop, support them by stakes. (Fig. 3.) As the seed pods open and the seed turns black before it is ripe, care should be taken not to gather the heads until most of the seed is really ripe, but before it begins to shatter. Cut the seed stalks with about a foot of stem and spread them one head deep in trays lined with paper, in order to save the seed which falls out. Expose these trays to the sun and air until the seed is entirely dry; then rub it out, winnow, and store it.

FIG. 3.—Seeding plants of onion in a home garden. They are in blossom and should be staked.

There are a number of kinds of onions that rarely produce seeds, but are increased by sets or bulblets which grow in the blossom heads, often entirely replacing the blossoms. One group of these, called winter-top, asparagus, or perennial onion, does not make large bulbs, but is extremely hardy. The top sets of these may be planted anywhere in the United States during September and will give a good crop of early spring onions. These sets are easily stored from the time of ripening until planting time in the autumn, and no gardener need purchase sets after once getting a stock.

Another group, called spring-top or red-top onions, is not quite so hardy, but the top sets will make good-sized dry bulbs for storing. They should be planted as early as possible in the spring. The sets when ripe may be stored in a cool attic or second-story room.

There is yet another type of these onions, called potato or multiplier onions, which does not make either top sets or seed. The bulbs of these split up into a number of bulblets, each of which, if planted in September, will produce large dry bulbs for winter use the following year. The large onions planted at the same time produce sets. This group is hardy as far north as central Pennsylvania and may be planted in early spring north of that latitude, producing heavy crops in highly enriched soil.

Shallots are similar to the potato onions just described, but they never grow into large bulbs. The two types are frequently confused, and sets of shallots are sometimes sold for potato onions.

LEEK.

The saving of seed of leeks is identical with that for onions, but the plants are hardier and do not need so much protection.

POTATO.

Potatoes are tubers or swollen stems and so are grouped here rather than with root crops. For the quantities used in the home garden it is, in general, better for the gardener to rely on his local dealer for a supply of northern-grown seed tubers. If he is located in the North, however, he can successfully save his own seed potatoes. These can be stored in a cold but frost-free cellar if available, but are very satisfactorily kept in an outdoor pit.

For further information in regard to potatoes, see Farmers' Bulletin 1332, "Seed Potatoes and How to Produce Them," and Farmers' Bulletin 847, "Potato Storage and Storage Houses."

BIENNIALS THE ROOTS OF WHICH ARE EATEN.

This group comprises all of the root vegetables except early radishes. The part used is the swollen root in which the plant has stored a supply of nourishment for use in the spring to push up its seed stalk in the shortest possible time. It is thus necessary to make seed growing a separate process from crop production.

PARSNIP AND SALSIFY.

Parsnips and salsify are hardy, and the roots may be safely left in place through the winter. As early in the spring as they can be handled and before they start into growth, the roots should be dug, carefully sorted, and the selected ones immediately reset from 3 to 5 feet apart. They will start into growth at once, and generally will produce a good crop of seed. The parsnip can be safely left in place until the seed crop is fully ripe, when it can be cut and stored under shelter till dry. The heads of salsify open out as they ripen, and unless gathered the seed will be blown away. It is necessary, therefore, to gather the opening heads before noon of every sunny day and spread them in an airy place until dry, when the seed can be rubbed out, winnowed, and stored.

BEET, CARROT, TURNIP, AND LATE RADISH.

The roots of the plants in this group must be stored over winter in some way, as they will not endure freezing. Seed can rarely be grown satisfactorily from the large hard roots taken from the spring plantings and can seldom be grown profitably in the home garden. When it is attempted, it is best to make special plantings in midsummer, taking pains to protect the plants from early frost and to pull and store them before severely cold weather. For seeding, select roots of a uniform, desirable character, remove the tops without injuring the central bud, cure by exposing them in the shade for a few days, and bury them. Cover lightly at first, but to an increasing depth as necessary to prevent their freezing. Set reselected roots as

early as the ground can be worked, carefully protecting them from frost. As the seed stalks grow, support them by stakes.

Turnips must be harvested as soon as the pods turn yellow, being cut in the early morning to avoid shattering and laid on papers in a protected place. When the seed is ripe, it is readily beaten out; then it is to be winnowed, spread thinly for further curing, and stored when dry.

Beets (figs. 4 and 5), carrots, and late radishes may have the seed left on the plant until ripe, when the stems should be cut and dried under shelter. The problem of threshing and cleaning these three kinds of seed is more difficult than with most seeds. The pods of radish and the seed-bearing branches of the beet and the carrot may be placed in a strong cloth bag and beaten or rubbed until the seed can be successfully winnowed and cleaned for storing.

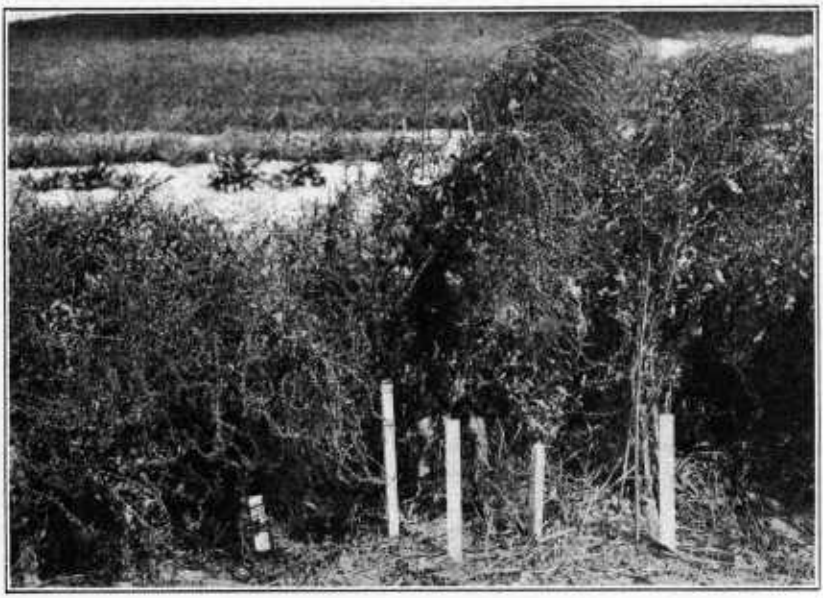

FIG. 4.—Seeding plants of beet, planted on the scale required for a home garden. Note that there is more than one plant and that the stalks are staked.

It is very necessary to plant at least two roots of beets, turnips, or radishes, as isolated plants often fail to produce seed. Carrots also will hybridize with the wild carrots so common as a weed in parts of this country, thus lowering the quality of the crop.

PERENNIAL VEGETABLES.

Only two garden vegetables belonging to this section are common enough to require consideration here.

ASPARAGUS.

This is a plant of which the young, tender stems are the part used. An asparagus bed if well cared for will not need replacing for many years. The sexes are found on separate plants, so it is difficult to

insure that both parents of any lot of seed shall have been superlative plants.

Seed saving should begin in the spring when stools which produce the greatest number of fine stalks should be marked by stakes. Seed from these selected plants will be better than unselected commercial seed. The best way to store small quantities is in the dried berries. These may be broken up at planting time. To clean asparagus seed in large amounts, the berries are beaten off the plants on a sheet and are then crushed in a barrel with a pestle or run through the apple grinder or a hand cider mill. This crushed mass should be stirred in abundant water and the hulls poured off until the seed is clean, when it should be spread thinly and dried.

RHUBARB.

This vegetable may be grown from seed, but seedlings show great variation. Seed is readily harvested and saved, but it is much better to purchase divided roots of known varieties.

FIG. 5.—Seeding beets grown on a scale suitable for a market garden.

LABELING, FUMIGATING, AND STORING VEGETABLE SEEDS.

Seeds which have been grown and carefully saved should be well labeled and stored or all the previous labor goes for nothing. Cloth bags are the best containers for large seeds, such as peas, beans, and corn. They should be used also for larger quantities of small seeds, but for smaller lots paper envelopes, made at home or purchased, are most desirable. Ordinary letter envelopes are fairly satisfactory, but usually are not gummed so as to close completely, and if handled carelessly small seeds may sift out of them.

Correct labeling is of paramount importance. Every envelope or container should show the kind and variety of seed, the date, including month and year when harvested, and the place where grown. For the cloth bags, a slip of paper bearing all this information

should be inserted with the seed. It is very convenient also to have a tag on the outside of the bag, but on no account should the inner label be omitted, because of the liability of loss of the outside tag.

Many seeds, especially beans, corn, and lettuce, are subject to injury by a number of insects, all of which may be destroyed by fumigation with carbon disulphid. Carbon disulphid is a liquid that can be purchased in tin cans at any drug store. When poured into a dish it evaporates rapidly, producing a foul-smelling gas that is heavier than air. Therefore, in fumigating seeds to kill insects attacking them it is necessary to place the carbon disulphid on top of the seeds in order that the gas may sink into them and reach every part of the container. A tight tin pail, box, or barrel makes an excellent container for fumigating seeds. For a tight barrel full of seeds one-half cupful of carbon disulphid is sufficient. For smaller containers, use in proportion.

Seeds to be fumigated must be dry, and if they are in paper bags, the bags should be opened. The gas penetrates cloth bags easily. The liquid may be placed in any shallow dish, such as a saucer or plate, or merely poured on the seeds. The liquid will not injure the seeds if poured directly upon them. Immediately after starting the fumigation, the container should be covered with several thicknesses of heavy paper, or other tight cover, and allowed to remain covered from one to two days. A longer fumigation in tin pails is apt to injure the germinating power of the seeds.

Carbon-disulphid gas is highly inflammable. No lights, or fire of any sort, should be allowed near while fumigation is in process, or an explosion may occur. The foul odor of the gas disappears after the seeds have been aired for several days.

After the seed has been properly labeled, and fumigated if required, it is necessary to store in a dry, well-ventilated room. Cellars are too moist, attics usually are too hot, but a second-story room furnishes the ideal location. Seed can be protected against mice by storing in tin boxes or mouse-proof wooden boxes, or by suspending in cloth bags.

DURATION OF VIABILITY OF SEEDS.

The question of how long certain seeds should retain satisfactory viability is often asked, but can not be answered with exactness. No table claiming to give exact periods is of much value when applied to any particular lot of seed. Conditions of weather while growing and of care used in harvesting and storing vary so much that the length of time any certain sort of seed will be worth planting is impossible to predict.

Some seeds retain their viability longer than others, however, and vegetables may be divided into three groups, as follows:

Good for one to three years: Beans, corn, leek, onion, parsley, parsnip, peas, rhubarb, and salsify.

Good for four to six years: Asparagus, beet, Brussels sprouts, cabbage, carrot, cauliflower, celery, cress, kale, kohl-rabi, lettuce, okra, pepper, radish, spinach, tomato, and turnip.

Good for seven to 10 years: Chicory, cucumber, eggplant, endive, muskmelon, mustard, and watermelon.

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